

In the drawings:

Please substitute the attached sheet of formal drawings containing Figure 15A for the corresponding sheet of formal drawings previously submitted. This substitute sheet includes reference numeral 156 which appeared in the originally filed informal drawings.

## REMARKS

Claims 1 - 20 remain active in this application. The specification has been reviewed and editorial revisions made where seen to be appropriate. In regard to the typographical correction of a number of a U. S. Patent incorporated by reference in paragraph [0015] it is respectfully pointed out that the correct number appears in a reference thereto in paragraph [0027]. A reference numeral appearing in the originally filed informal drawings has been supplied in Figure 15A of the Formal drawings. Claims 1 and 12 have been amended. Support for the amendments of claim 1 is found throughout the application, particularly in Figures 3, 10 and 15A - 15G and the description thereof in paragraph [0026]. Amendments to claim 12 merely seek to improve antecedent language correspondence. No new matter has been introduced into the application.

Claims 1 - 4, 7 - 12 and 14 - 20 have been rejected under 35 U.S.C. §102 as being anticipated by Hummler ('677 - hereinafter simply Hummler). Claims 6 and 7 have been rejected under 35 U.S.C. §103 as being unpatentable over Hummler. Claim 13 has been rejected under 35 U.S.C. §103 as being unpatentable over Hummler in view of Gustafson. All of these grounds of rejection are respectfully traversed.

It should be appreciated that hummler is cited and incorporated by reference in the present application in paragraph [0015] thereof with further reference being made thereto elsewhere in the original specification such as in paragraph [0027]. Therefore, substantial similarities of some aspects of the present invention to that of Hummler are to be expected while the invention is clearly and patentably distinguished therefrom in the

original specification, as well. It may also appear that some distinctions between the present invention and Hummler may, superficially and in the abstract, seem somewhat subtle but it should be recognized that the process refinements in accordance with the invention provides for substantially improved manufacturing yield in high density integrated circuits having small minimum feature sizes where the process of Hummler, without such refinements, has proven inadequate to produce acceptable manufacturing yield.

In regard to claim 1 and claims 2 - 11 depending therefrom which are directed to a method of manufacture of a semiconductor device having respective (e.g. differentiated) first and second areas, the first step explicitly recites "reducing height of structures in said *first and second areas*" (emphasis added). The purpose for which this is done has now been recited in claim 1 for emphasis. While Hummler teaches recessing of an isolation structure in the support area of the chip and isolation structure may be included in the array area of the chip, recessing of isolation structure in the array area is not taught and recessing of the isolation structure in the support area is indicated to be optional (column 5, line 54+). No meritorious effect is attributed to this step in Hummler if it is performed whereas paragraph [0026] of the specification clearly discloses such a meritorious effect (which has now been added substantially verbatim to claim 1) when such recessing is performed in both the first and second areas since it sets the isolation structure heights in both the first and second areas independently of the array top oxide (ATO) processes and facilitates (defect free) planarization of the ATO, including achievement of extremely stringent tolerances for planarity in order to

lithographically pattern extremely dense wiring patterns. By the same token, the recessing of an isolation structure in only one of the first and second areas does not and cannot achieve such a meritorious effect and the teachings of Hummler do not anticipate the recitations of claim 1 or claims depending therefrom.

Additionally, claim 1 explicitly recites the use of a polysilicon mask or a mask having two layers of different materials as a block-out mask for different processing of the first and second areas of the chip. This recitation is also a significant and patentably distinctive difference from Hummler which does not teach or suggest such a mask since, as discussed in paragraph [0027] of the present specification, such a mask also contributes to reduction of step height while providing improved protection. It is respectfully submitted that Hummler fails to anticipate any of claims 1 - 11 for that reason, as well. Further, in regard to claims 5 and 6, the Examiner admits that Hummler does not teach a polysilicon hard mask but merely deems the same to be obvious. Clearly, such an assertion indicates an exercise in hindsight since Hummler does not lead to an expectation of success in achieving the advantage provided by a polysilicon hard mask in combination with the remainder of the claimed subject matter.

In regard to claims 12 - 20 which are directed to an alternate process for planarization which can reliably achieve a 15 nm planarity tolerance by using a planarizing material such as an anti-reflection coating (ARC and then performing a *non-selective etch* such that a planar surface is maintained throughout the etch process regardless of the material being etched, it is respectfully pointed out that the mention of using ARC followed by a reactive ion etch (RIE) in Hummler at

column 7, lines 3 - 17, is simply for the purpose of opening the tops of the gate electrode contacts and no planarizing effect is attributed thereto although planarizing by CMP is mentioned as an alternative process for opening such contacts. In this regard, it should be noted that a reactive ion etch is not necessarily sufficiently non-selective for planarization, as claimed, as an alternative to planarization by CMP absent the particular conditions for non-selectivity disclosed in paragraph [0036] of the present specification. In this regard, it is respectfully submitted that there is no need for (and thus no implication of non-selective RIE) in Hummler since only the ATO and a thin layer of the support nitride liner 42 overlying pad nitride 14 is etched while opening the gate electrode contacts. In other words and simply put, while a CMP planarizing process may be used to open contacts, an alternative process for opening contacts does not imply that a planar surface will be produced or that conditions necessary to produce a planar surface in the same process were known prior to the present invention. Thus, Hummler does not anticipate any on claims 12 - 20.

In regard to claim 13 in the rejection of which the Examiner also relies of Gustafson et al., it is respectfully submitted that the Gustafson et al. does not mitigate any of the above-discussed deficiencies of Hummler and the Examiner does not even suggest that it may do so. Therefore, it is respectfully submitted that the Examiner has not made a *prima facie* demonstration of obviousness in regard to claim 13. Rather, the Examiner merely notes that Gustafson teaches end-point detection for a process while evidently overlooking the fact that Hummler points out an advantage of ATO residing over the support liner to provide additional process margin (i.e.

in lieu of end point detection) thus, The fact that end-point detection may be possible or advantageous in some circumstances does not indicate that it would be possible or, if possible, serve any useful purposes in other circumstances such as the process of Hummler. Therefore, the combination of Gustafson et al. with Hummler also appears to be an attempt at hindsight reconstruction of the invention.

In view of the foregoing, it is respectfully submitted that the Examiner has not made and cannot make a *prima facie* demonstration of anticipation or obviousness or any claim in the application but, rather, has construed Hummler beyond the actual teaching suggestions and evidence of the level of ordinary skill in the art well beyond the actual content thereof. Accordingly, it is respectfully submitted that all of the grounds of rejection asserted in the current office action are clearly in error and unsupported by the reference relied upon as well as being clearly untenable in view of the amendments made above. Therefore reconsideration and withdrawal of the asserted grounds of rejection are respectfully requested.

Since all rejections, objections and requirements contained in the outstanding official action have been fully answered and shown to be in error and/or inapplicable to the present claims, it is respectfully submitted that reconsideration is now in order under the provisions of 37 C.F.R. §1.111(b) and such reconsideration is respectfully requested. Upon reconsideration, it is also respectfully submitted that this application is in condition for allowance and such action is therefore respectfully requested.

If an extension of time is required for this response to be considered as being timely filed, a

conditional petition is hereby made for such extension of time. Please charge any deficiencies in fees and credit any overpayment of fees to Deposit Account No. 09-0458 of International Business Machines Corporation (E. Fishkill).

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "Marshall M. Curtis", written in a cursive style.

Marshall M. Curtis  
Reg. No. 33,138

Whitham, Curtis, Christofferson & Cook, P. C.  
11491 Sunset Hills Road, Suite 340  
Reston, Virginia 20190

(703) 787-9400  
Customer Number: **30743**

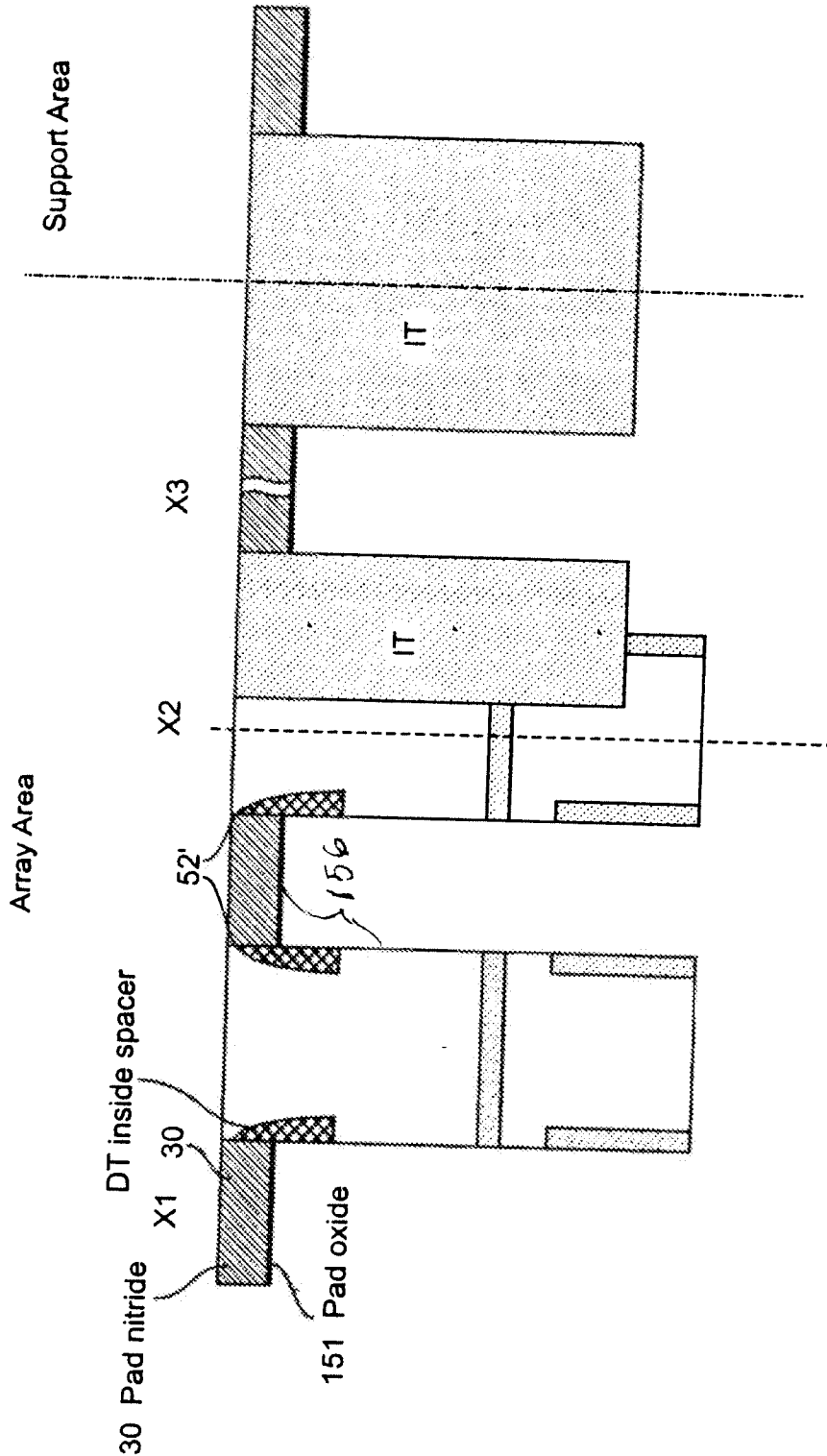


Figure 15A